IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 15, Issue 12 Ver. II (December. 2016), PP 68-70
www.iosrjournals.org

Chemotherapy-Induced Jejunal Stricture in a Child with Retinoblastoma: A Rare Case Report

Hassan R A A[1], Kim C K, Khairil A[2], Ridzuan A S[3]
Paediatric Surgery Unit, Department Of Surgery, School Of Medical Sciences, Universiti Sains Malaysia, Kubang Kerian, Kelantan, Malaysia.

Corresponding author:
Prof. Dr. Hassan R A A Cosultant Pediatric Surgeon
Unit of Pediatric Surgery. HUSM Kubang Kerian 16150, Kelantan, Malaysia.
Email: drrahassan@gmail.com

Introduction*: Treatment with a combination of chemotherapy and radiotherapy is known to be associated with gastrointestinal stricture in both children and adults with malignancies. However, gastrointestinal stricture resulting from chemotherapy alone is a rare complication in paediatric malignancies. We experienced a rare case of jejunal stricture causing small bowel obstruction in a child with retinoblastoma during receiving chemotherapy.*

Keywords: *Jejunal stricture; Retinoblastoma; Chemotherapy*

I. Case reports

A 16-month old Malay boy was diagnosed with retinoblastoma of left eye with left optic nerve infiltration and lung metastasis at the age of 10-month old.

He was subjected to extra-ocular orbital retinoblastoma treatment protocol and underwent 3 cycles of pre-operative combination chemotherapy within 13 weeks. The first and third cycles of intravenous chemotherapy comprised of ifosfamide, carboplatin, etoposide, vincristine and concomitant triple intrathecal therapy. The second cycle of chemotherapy comprised of vincristine, cyclophosphamide and idarubicin. The enucleation of left eye was performed two months after completion of 3 cycles of chemotherapy.

He initially presented with non-bilious vomiting, diarrhoea and fever for 2 days shortly after the third cycle of chemotherapy. Since there was no sign of acute intestinal obstruction, he was treated as acute gastroenteritis with febrile neutropenia and was commenced on empirical antimicrobial therapy (intravenous piperacillin/tazobactam, amikacin, and metronidazole). Blood and stool cultures were negative.

However, one week later patient developed frequent bilious vomiting and abdominal distension. On physical examination, he was febrile and tachycardia. There was no palpable abdominal lump.

Full blood count revealed persistent pancytopenia with neutropenia (WBC: $0.34x10^9$/l, hemoglobin: 9.5g/dl, platelet count: 52×10^9/l). Renal profile showed hypokalaemia and hyponatremia.
He was managed conservatively as a case of partial bowel obstruction; kept on gastric decompression and total parenteral nutrition.

Four months after the completion of chemotherapy, he underwent exploratory laparotomy for acute intestinal obstruction. Abdominal plain film demonstrated dilatation of proximal small bowel and stomach (Figure 1). Urgent CECT abdomen revealed marked dilatation of stomach, duodenum and proximal jejunum, with sudden tapering and collapse of ileum and colon (Fig 2). There was no intra-luminal or extra-luminal mass seen. Multiple lung nodules were noted at bilateral lungs, suggestive of lung metastases.

In laparotomy, there were multiple adhesion bands mainly in the proximal small bowel and matted bowel loops & multiple strictures causing complete obstruction. Resection of 15 cm jejunum and primary anastomosis were performed.

Histopathological examination of the resected jejunum revealed benign strictures with the presence of chronic inflammatory cells including lymphoplasma cells. There was no evidence of malignancy.
Post-operatively, patient was ventilated in intensive care unit. Unfortunately, he developed sepsis secondary to Escherichia coli bacteraemia and passed away 3 days after the surgery.

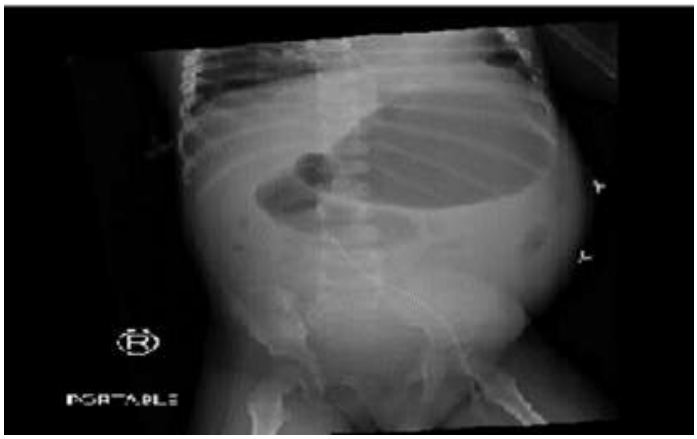

Figure 1: Abdominal plain film showed dilatation of proximal small bowel and stomach

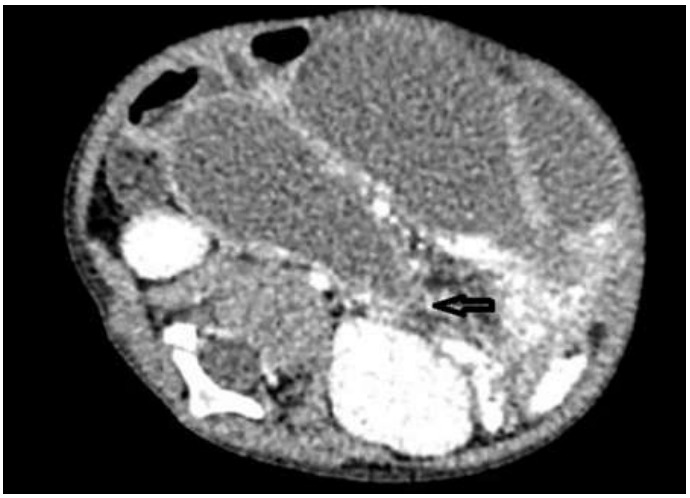

Figure 2: CECT abdomen revealed marked dilatation of stomach, duodenum and proximal jejunum, with abrupt tapering of distal jejunum (arrow), and collapsed ileum.

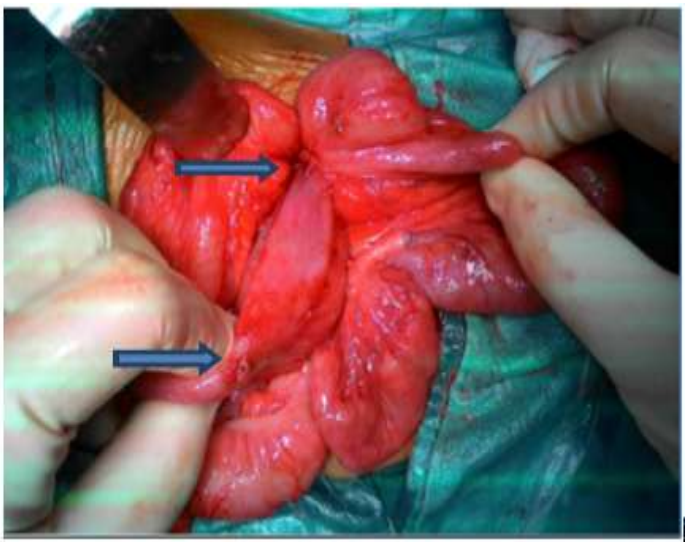

Figure 3: Multiple strictures (arrows) and adhesion bands in the proximal small bowel.

II. Discussions

Retinoblastoma is the most common malignant intraocular tumour in children [1]. It accounts for about 4% of all paediatric malignancies [2]. Extra-ocular retinoblastoma remains a challenging disease to treat.

Current treatment approach for extra-ocular orbital retinoblastoma is reducing the tumour mass with neoadjuvant chemotherapy, followed by enucleation and subsequent adjuvant chemotherapy and external beam

radiotherapy to the orbit [3]. In our patient, 3 cycles of pre-operative chemotherapy comprised of alternate ICEV (ifosfamide, carboplatin, etoposide, and vincristine) and VChId (vincristine, cyclophosphamide, and idarubicin) were used to reduce the tumour mass prior to enucleation.

Chemotherapy is known for short- and long-term gastrointestinal toxicities [4]. However, it seems that late gastrointestinal toxicities induced by chemotherapy are uncommonly reported with chemotherapy alone with the exception of secondary gastrointestinal cancers [4]. One of the late gastrointestinal toxicities is intestinal stricture which may end up with intestinal obstruction.

Cytotoxic chemotherapy agents have a direct effect on the gastrointestinal mucosa causing inflammation, oedema, ulceration and atrophy [5]. However the exact underlying pathophysiology of chemotherapy-induced intestinal stricture is yet to be elucidated.

There are very few reports in the literature of chemotherapy-induced intestinal strictures in paediatric patients. Gupta G et al. reported a child with primary gastrointestinal B-cell Non-Hodgkin lymphoma who presented with jejunal stricture developed as a sequela of severe chemotherapy-induced mucositis [6].

In a cohort study by JP Kerr et al, benign intestinal strictures were present with an incidence of 18% among 33 cases of large B cell primary gastrointestinal lymphoma which lead to intestinal obstruction [7].

However, intestinal stricture after chemotherapy for retinoblastoma in children has not been reported in current literature. To our best knowledge this is the first reported case.

Other gastrointestinal toxicities included diarrhoea, mucositis and vomiting were reported by B Kremens et al. in 3 out of 5 children with metastatic retinoblastoma after receiving high dose chemotherapy [8].
In our case, we attribute the cause of the jejunal strictures to the complication of chemotherapy. There is no evidence of malignancy or infection, confirmed by histopathological findings. There was no prior history of radiotherapy to the bowels.

Until today the mainstay treatment modality of intestinal stricture has been surgical resection through a laparotomy. Gupta G et al described successful management of a chemotherapy-induced jejunal stricture with surgical resection of stricture and end-to-end anastomosis [5]. Laparoscopic-assisted resection of an ileal stricture in a child with B-cell Non-Hodgkin lymphoma was firstly reported by Malakounides G et al, thus avoiding the need for a laparotomy incision [9].

III. Conclusion

Small bowel stricture should be considered as a complication of treatment with chemotherapy alone in children with malignancies.

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